Electro Contra: Innovation for Tradition

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ABSTRACT

Technological interventions in American traditional fiddle and dance music are presented and specific design and development problems are considered. As folk dance communities and events explore the notion of incorporating modern electronic dance music into the experience certain inherent problems are exposed. Maintaining strict musical forms that are required for the traditional choreography, maintaining the fluidity and control of live bands, and interacting with the other performers require new software tools. Initial solutions developed in Ableton Live are described and show a successful method of solving these challenges.

1. INTRODUCTION

Traditional aural music practices around the world evolve and maintain currency with the incorporation of new musical instruments and technologies. In the twentieth century steel strings for guitars and violins, the advent of amplification and electric instruments, and increased manufacture and access to instruments had transformative impacts on music around the world. New genres grew out of the new technologies, such as Jazz and Rock and Roll, exploding in dance halls and on concert stages alike. Amplification is now a ubiquitous aspect of dance music performance in nearly every genre, from social and couples folk dancing to swing to electronic dance music (EDM). Today, computers present an immense domain of musical possibilities and their incorporation as a performance tool in traditional folk music, alongside fiddles and banjos, is already underway.

Performing 'traditional music' electronically, on a technical level, presents many challenges to the electronic musician using currently available software tools. Most folk dance choreography fits strict musical forms and any musical deviations will disrupt the dancers and stop the dance. The music has to start and line up with the figures of the specific dance, requiring the musician to synchronize the phrasing with choreography. Further, the music is expected to dynamically respond to the dancers through texture changes and growth of a song, facilitating energetic and emotional experiences.

Based on these challenges several new software tools (plug-ins for Ableton's Live Suite) have been designed, developed, and evaluated. The specific goals and problems, primarily centering on phrasing and maintaining phrase alignment, lead to the implementation of three tools for performance use. These provide a relative beat jump, an absolute beat jump, and an automatic clip synchronization tool. Use in a series of performances and dance events show that these are effective in practice, but present challenges of their own and a need for further design and development.

2. CONTRA DANCE

American contra dance is a vibrant living tradition of dancing and music performance that has been steadily growing in popularity since the 1970s. Involving instruments, music, and choreography derived from eighteenth century practices in the British Isles, contra dance now has active communities across North America, Europe, and Australia. The current form of contra dance was first seen in the U.S. in the 1780s [3], and after disappearing from practice in the following century was reborn during the folk revival in the United States in the 1970s [8]. While the closely related forms of English, Scottish, and Irish dance followed the same trajectory they have become historically oriented practices, privileging traditional choreography and costumes. Uniquely, contra dance actively supports regional and individual variation, new choreography, and experimentation with the forms and music [4].

The structure of contra dance employs two lines of dancers (the designation "contra" refers to this opposition of lines), who progressively move along the lines to dance with other individuals. The choreography typically involves each sub-set of four dancers (two couples) executing a series of steps in unison that take up the 64 beats of the written dance [1]. All the dancers execute each figure in the dance concurrently and a series of 4-8 figures typically comprises a "dance," which is then repeated 12-20 times along with live musical accompaniment.

The vast majority of the choreography is set to a binary musical form of AABB, wherein each section is 16 beats long. The music is performed live and is historically rooted in the traditional music of the British Isles (Irish and Scottish 'fiddle' tunes). The meter is most commonly 2/2 or 6/8, and is strongly phrased to indicate the 8 bar sections, which dancers rely on for structural cues and to "keep them on track" [3]. Dance tempo does not vary widely, and is conventionally in the 115-125 beats-per-minute range [4].

The notion of "tradition" is integral to contemporary contra dancing, and the ideals of a non-commercial 'folk'

community and 'traditional' Americanness are primary components in drawing many to the group [8]. As such these values are felt strongly amongst the community and guide many aspects of direction and organization locally and nationally. Musically, these ideals privilege 'traditional folk' acoustic instruments (such as the fiddle, piano, banjo, and acoustic guitar), and tunes in strict musical forms (e.g. 2/2 metered Reels and Hoedowns; 6/8 metered Jigs and Marches).

However the authenticity of the 'tradition,' in terms of longevity of customs and practices, is largely a chimera [8]. While some smaller communities in the North Eastern U.S. maintain a closer aural, generational link to the ancestral dance forms [9], for modern urban contra dance the authenticity of the musical tradition, in terms of repertoire and performance practices passed down aurally from generation to generation, is non-existent. The community of dancers is intentional and associational, rather than based on ethnic, religious, or locational alignment [3].

The upholding of tradition creates friction with the living practice aspect of contra dance, leading many contemporary musical groups to both retain traditional instrumentation while experimenting with a diversity of genres and sounds. One of the most popular notional contra dance bands today, The Great Bear Trio [5], is lead by an electric guitar and regularly features arrangements of Top 40 radio songs. Another extremely popular band, Perpetual eMotion, used looping technology and extensive electronic effects applied to the fiddle and guitar to create live EDM-styled dance music [6].

The first noted examples of contra dancing to non-traditional pre-recorded music at mainstream contra dance events is thought to have occurred in the early 2000s in the Boston area [6]. This lead to alternative dances colloquially termed "techno contras" [2], being staged across the U.S. today. Many self-styled DJs use mixes of EDM, pop, world beat, and fusion music to stage these events at festivals annually. Almost all of these performers premix compilations of songs by other artists and play these tracks in a fixed fashion to accompany the dance. These DJs have further explored changing the nature of the event from the conventional series of approximately 10 minute dances interleaved with short breaks to more continuous sequences of dances (some reportedly stringing dances together for as long as 90 minutes without pause).

The desire to incorporate electronic dance music in contra dance events appears to be based on fostering intense emotional experiences [7] and perceived "altered states". Contra dance already creates these experiences for many through the highly repetitious dance forms and musical tunes, akin to a group recitation of a mantra [3]. Likewise, EDM is known for supporting similar experiences through looping, and iconic production techniques such as the "build-up" and "drop" [7]. The receptiveness of the otherwise traditionally oriented contra dance community to EDM type music may be based on this affinity for altered state experiences, allowing for this seemingly radical influx of distinctly non-traditional music.

Performing live, interactive electronic music for contra dances is currently being attempted by a few national acts, notably Buddy System, DJ D.R. Shadow, DJ Squeeze, and Phase X. These artists use a combination of DJ software, controllers, electronic and amplified acoustic instruments and effects. The work described herein is based on the experiences and findings of members of these groups.

3. MUSICAL STRUCTURE

The primary problems faced by live electronic music in the contra dance context stem from the strict requirements of the phrase structure and the need to aurally cue and indicate the repetitions in the form. The binary pattern of AABB, as well as the continual recycling of the whole form (over each 8-10 minute dance), are expected and relied on by the dancers [3]. This stands in contrast to the typical pop music song form of AABA and EDM forms which focus on continuity and minimalist trance-like repetition. Further, pop songs commonly deviate from 32 bar forms to include a bridge section or other variations, which precludes their use in this context.

The electronic performer can create the form by discarding loops and playing everything live using controllers and MIDI interfaces (i.e. treating their setup like an acoustic instrument and 'playing all the notes'). However this denies the hallmark sounds, sampled loops, and operating principles EDM is based on. The opposite approach seen above, of acoustic musicians playing contemporary pop songs for dances, merely appropriates the content of one genre and transposes it to another, rather than exploiting the potential of fully blending the genres.

Groups providing live music for contra dance must additionally be able to recover from errors enacted by the caller or dancers. While not common, either the caller may mistakenly call a figure or the dancers may forget and cause the dance to get out of sync with the music or come to a stop. It is imperative that the musicians are able to either resynchronize with the dance (by adding a few beats or skipping ahead in the song), or quickly reset and recover by starting over.

An additional problem arises solely at the commencement of each dance where the musician must either cue the start of the choreography or align with the caller/leader. Conventional acoustic contra dance bands start each dance in one of two ways: either by playing a short four beat introduction to indicate the start of the dance to the dancers, or by playing a repetitious musical pattern in the tempo of the dance and allowing the caller to time the figures to the music. In this later case once the dancers are all in motion the musicians will seamlessly transition to their full tune/song/arrangement.

Ableton Live is a preferred software solution for many live electronic musicians playing on the contra dance stage due to its flexibility and interactivity (see Fig. 1). The ability to play loops, clips, and songs dynamically and apply further manipulations is the basis for these performers. However the challenges of phrase alignment in this environment are seen as cumbersome and constraining to expressive performance. For example, if the user wants to change material in the middle of the 32-bar form there is no easy way to quickly trigger new loops and cross-fade or cut the old ones while still ensuring adher-

ence to the dance structure. If the user accidently triggers clips or sections at the wrong time there is no way to recover without impact to the musical form.

Figure 1. Ableton Live Set used for contra dances (image courtesy Julie Valimont) showing density of musical tracks and clips.

4. NEW DEVELOPMENTS

Based on discussions with performing musicians three Live "devices" (plug-ins or utilities in Live's parlance) were proposed, developed, and tested. The overall goal is to ensure enforcement of the phrase structure, freeing the musician to focus on musical choices, texture and dynamic direction. The developed assistive utilities are:

1) Song jump device that instantly skips the entire session (all playing clips and events) to a specified bar and beat, or by a relative number of beats.
2) Track jump device that skips a single track to a specified bar and beat, or by a relative number of beats.
3) Clip synchronization device that maintains phrase alignment between a slave track and a master track (or the master clock).

All of these devices were built using Max For Live (M4L), working extensively through the Live API (in Max 7.2.2). This allowed easy modification during the prototyping stage as well as cross-platform distribution. The devices were used in performances during development, generating bug lists and feature requests stemming from real-world application.

The song jumping device (see Fig. 2) gives the player the ability to skip the song forward and backwards by single beats, assisting alignment with the dance if the music is out of sync, as well as jumping by whole sections to extend or shorten a song. This is analogous to a DJ moving the needle on a record, skipping the song to a new point in time. Ableton Live employs a model where each loop or clip is essentially an individual record with its own needle, and jumping the song causes all the clips to jump synchronously. The Live API exposes access to the master clock time ("current_song_time") which is set in the M4L device (through the "jump_by" function) when the user enters a new absolute or relative jump time.

The track jumping device performs similarly but only acts on a single track at a time, serving artistic effects and affording the alignment of different clips and loops. This uses the Live API "playing_position" property of a specific clip.

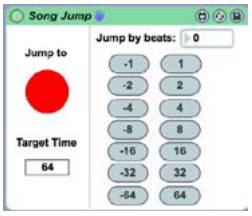

Figure 2. User interface for Song Jump device.

The clip synchronization device forces any track to stay aligned with either another track or the master clock. In Live the user can configure a quantization rate for clip launching, which causes clips to delay commencement to match a certain phrase length. That is, if the quantization rate is set at 2 bars clips will start playing when the master song clock is at even bar numbers regardless of when the user presses the clip launch button (see Fig. 3, showing misalignment resulting from the user triggering clips around the phrase point). While this effectively enforces clip alignment dynamically, longer phrase lengths (such as the 8 or 32 bar phrases in contra dances) present challenges and this quantization limits performer spontaneity. If the user triggers a clip one beat after the 8 bar quantization point the clip will wait 7 bars before playing (see Fig. 4). This limits the performer's ability to improvisationally mix the music and dynamically trigger new clips. The new clip sync device allows the user to turn off the global quantization, allowing any clip to launch at any time, and the device ensures phrase alignment (see Fig. 5 where clips start playing in the middle of their loop). As each clip is launched the device skips it to play from the point that aligns it with the configured phrase length.

Figure 3. Loops with quantization at 2 bars, long loops enter out of phase with 8 bar phrases.

Figure 4. Loops with quantization at 8 bars, aligned correctly with phrases, but limited flexibility.

Figure 5. Loops with no quantization and Clip Sync device. Loops can start in the middle with guaranteed phrase alignment.

In this device the phrase length can be set independently for each clip by the player (commonly 8 or 32 bars). For each given time point (t) the audio sample to play (X) is calculated from the time point of the master track (t_{master}) folded by the length of the phrase in samples (based on the user set length in beats P, the tempo T, and the

sample rate of the audio engine *sr*) and the length of the slave track's audio loop (L, in samples):

$$X_t = t_{master} \bmod PTsr \bmod L \qquad (1)$$

5. REFLECTIONS

All of these devices have been used in over a dozen performances, each lasting 1 to 3 hours, and have proven to be stable in practical use. The song jumping device was intended to solve the problem of transparent alignment with the start of the dance. In theory the musician would build a looped groove for the caller to teach the dance, and at the point the dancers have begun the choreography the musician would align and cross fade to their song tracks. To enact this alignment the musician would launch their song tracks at any point and at the moment the dance reaches the start of the choreography (the beginning of the first A section) the musician pushes the "jump to start" button, causing the entire song to jump to beat 0 and be aligned with the dance.

However, this operation in Live causes any clips that were launched after beat 0 to be turned off. Practically this results in everything stopping at the critical moment when the musician is aligning their song with the start of the dance. Thus this functionality does not work as intended. However the device enables smaller relative jumps by a beat or a bar, moving the playback for all playing clips simultaneously, and has proven useful as an error correcting measure if the dancers get out of sync with the music.

The track jump device does not suffer from this problem, since jumping a track to beat 0 still allows the track to keep playing. Thus this device solves the previous problem, of restarting the track when the dancers reach the start of the dance. It does not, however, allow many tracks to be moved simultaneously, but appears to be adequate for initial use (typically users start their arrangement for a dance with a single track, which this device enables, and then build from there). In combination with the third device the track jump solution has proven effective in quickly aligning the entire set.

As an error recovery tool, especially to realign after the caller or dancers make a mistake, the track jump device has proven highly successful. As long as the musician knows where the start of the first A section is in the dance they can use the track jump device to immediately jump to that point in the music to coincide with the dancers. This is a critical ability for the live music.

The clip alignment device appears to be the most transformative of the three utilities. This functionality allows a musician to start a musical loop or sample at any time point and ensure that it remains sample locked to a master track (or master clock). In practice this gives the musician a lot of freedom to start musical material without worrying about where in the form structure they are. Previously the musician had to remember the length of each sample clip they had loaded into their set and then trigger it precisely to align with the dance form. While Ableton provides a quantization method to ensure clips only start at certain points this prevents dynamic interleaving of new clips at a finer granularity. If the musician wants to start a new percussion line in the middle of the quantization length, or start in the middle of the percussion loop, it is now possible.

6. CONCLUSIONS

While these new devices successfully assist the live electronic musician in performing for contra dance events additional tools will be needed to support artistic creativity in performance. Several specific problems were teased out and addressed with new software tools that have been field-tested and are in current use by performing artists. Further, these devices may be useful to Ableton Live users generally, beyond the domain of folk dance music.

The interviewed musicians, all of whom have extensive experience as acoustic performers, continue to seek flexible ways of dynamically creating their music and interacting on the dance stage. This confluence of 'traditional' folk dance and electronic dance music is attracting musicians and dancers alike to events around North America and promises to continue serving as a locus for experimentation and growth. As new artists bring new approaches and new technology to the dance stage, new practices, instruments, and tools will be discovered and incorporated into these evolving traditions.

7. REFERENCES

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